

In the Abstract of the Disclosure

Please rewrite the Abstract of the Disclosure as follows:

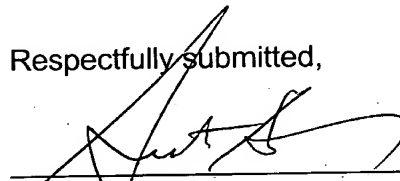
(Amended) ABSTRACT OF THE DISCLOSURE

A¹⁰
A vehicle-mounted input unit including a manual manipulator that gives the operator a feel of resistance varying with what is done with the input and thus affording excellent operating convenience. In a memory unit provided in a control section there are stored tables showing correlations between the operating directions and quantity of a manual manipulator and an external force applied to the manual manipulator from actuators. The control section determines the direction and magnitude of the external force to be applied to the manual manipulator from positional information supplied from position sensors and the tables and drives the actuators via an actuator driver. The external force to be applied to the manual manipulator can be regulated either according to the movable range of a vehicle-mounted electric device from its current position to an end of its possible motion or according to the magnitude of the working force applied to the manual manipulator.

REMARKS

Applicant has rewritten portions of the specification and the Abstract of the Disclosure. The changes from the previous version to the rewritten version are shown in attached Appendix A, with strikethrough for deleted matter and underlines for added matter.

Respectfully submitted,



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APPENDIX A
Attorney Docket No. 9281-4147
Vehicle-Mounted Input Unit for Centralized Operation of Various Vehicle-
Mounted Electronic Devices with Single Manual Manipulator
Hideki Masudaya

In the Specification

Please amend the paragraph beginning on page 6, line 12 and ending on page 7, line 6 as follows:

(Amended) However, where such a configuration is used, if an excessively strong force is applied to the manual manipulator 110, the engaging pin 160 will strike against an end of the guide groove 141 to subject the manual manipulator 110 to a heavy impact. This might not only make the operator feel unpleasant but also ~~makemakes~~ it impossible for the function regulating speed of the vehicle-mounted electric device to be appropriately controlled by regulating the quantity of the manipulation of the manual manipulator 110. Thus, in the configuration of the vehicle-mounted input unit 100 according to the prior art, the functional regulation of the selected vehicle-mounted electric device is accomplished by manipulating the rotary variable resistors 113 through 115 provided on the manual manipulator 110, but not by the manual manipulator 110 itself with the obvious result that the function regulating speed of the vehicle-mounted electric device cannot be appropriately controlled by regulating the quantity of the manipulation of the manual manipulator 110. Therefore, it is necessary to alternately use the manual manipulator 110 and the rotary variable resistors 113 through 115, making it impossible to quickly regulate the function of any selected vehicle-mounted electric device.

Please amend the paragraph on page 8, lines 10-15 as follows:

(Amended) An object of the present invention, ~~attemptedis~~ is to obviate these shortcomings of the prior art, ~~isand~~ is to provide a vehicle-mounted input unit capable of enabling the manual manipulator to give its operator a feel of resistance varying with what is done by operating the manipulator and thereby affording excellent operating convenience.

Please amend the paragraph beginning on page 9, line 24 and ending on page 10, line 14 as follows:

(Amended) As this configuration enables the manual manipulator to give its operator a feel of resistance varying with the working force applied thereto, when for instance a powerful operator forcefully operates the manual manipulator, the feel can be strengthened or, conversely, when a relatively powerless operator operates the manual manipulator with a relatively small force, it can be weakened to enable the operator, irrespective of his or her relative power, to feel satisfactory operating convenience. Incidentally, the working force applied to the manual manipulator can be computed by differentiating twice a change in the position signals supplied from the position sensors to ~~figure out~~ascertain the operating acceleration of the manual manipulator, and applying the second law of motion ($F = m \cdot a$, wherein F is the working force applied to the manual manipulator, m is the mass of the manual manipulator and the operator's fingers, and a is the operating acceleration of the manual manipulator) to the acceleration thereby obtained.

Please amend the paragraph on page 14, lines 1-5 as follows:

(Amended) ~~Fig. 7 illustrates the available operating directions of~~7A illustrates a menu of vehicle-mounted electronic devices that can be selected by the manual manipulation. Fig. 7B illustrates the various directions that the manual manipulator mechanism ~~pertaining to the embodiment of the invention and the types of vehicle-mounted~~must be moved to select the various types of electric devices to be thereby selected in the respective directions.

Please amend the paragraph on page 14, lines 24-25 as follows:

(Amended) Fig. 14 shows an interior view of an automobile in which a prior art vehicle-mounted input unit is installed.

Please amend the paragraph on page 15, lines 1-2 as follows:

(Amended) Fig. 16 shows a plan view of a prior art manual manipulator of the vehicle-mounted input unit shown in Fig. 15.

Please amend the paragraph on page 15, lines 3-4 as follows:

(Amended) Fig. 17 shows a plan of a prior art guide plate of the vehicle-mounted input unit shown in Fig. 15.

Please amend the paragraph on page 15, lines 6-8 as follows:

(Amended) A vehicle-mounted input unit, which is a ~~first~~the preferred embodiment of the present invention, will be described below with reference to accompanying drawings.

Please amend the paragraph beginning on page 15, line 15 and ending on page 16, line 4 as follows:

(Amended) As is evident from Fig. 1, in a vehicle-mounted input unit 1 pertaining to this embodiment of the invention, a case 2 is formed in a rectangular container shape of a required size, and on the upper face of the case 2 are disposed a manual manipulator 3, six push-button switches 4a, 4b, 4c, 4d, 4e and 4f arranged in an arc centering on the setting section of the manual manipulator 3, three push-button switch 5a, 5b and 5c arranged outside the positions of and cocentrically with the six push-button switches, and a volume control knob 6. On the front face of the case 2 are opened a card slot 7 and a disk slot 8. This vehicle-mounted input unit is fitted, as illustrated in Fig. 2, on the dashboard A of an automobile between its driver's seat B and front passenger seat C and, cooperating with a display unit D provided on the dashboard A and a control section (not shown) housed in the dashboard A, can perform its required functions. It should be noted that this invention can be used in right hand drive vehicles, as illustrated, or left hand drive vehicles.

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A vehicle-mounted input unit ~~capable of enabling the~~including a manual manipulator ~~to give its~~that gives the operator a feel of resistance varying with what is done ~~by operating the manipulator and thereby~~with the input and thus affording excellent operating convenience ~~is to be provided~~. In a memory unit provided in a control section there are stored tables showing correlations between the operating directions and quantity of a manual manipulator and an external force applied to the manual manipulator from actuators. The control section determines the direction and magnitude of the external force to be applied to the manual manipulator from positional information supplied from position sensors and the tables and drives the

[illegible]